

CLAIMS

1. An interchangeable electrolyte for use in a battery cell and an electroplating cell,
each cell having a positive electrode and a negative electrode contactable with the
5 interchangeable electrolyte, the interchangeable electrolyte comprising an aqueous electrolyte
and a surface deposition modifying additive in an amount adapted to promote interchangeable
use in the battery cell and the electroplating cell.
2. The interchangeable electrolyte of claim 1 wherein the deposition modifying
10 additive limits dendritic electrodeposition on the negative electrode of the battery cell.
3. The interchangeable electrolyte of claim 1 wherein the deposition modifying
additive promotes smooth plating in the electroplating cell.
4. The interchangeable electrolyte of claim 1 wherein the aqueous electrolyte is
composed of sulfuric acid and water.
5. The interchangeable electrolyte of claim 1 wherein the deposition modifying
additive is an organic compound having at least 8 carbon atoms.
6. The interchangeable electrolyte of claim 1 wherein the deposition modifying
additive is an organic compound having a molecular structure having both a polar aspect and
a non polar aspect.
7. The interchangeable electrolyte of claim 1 wherein the deposition modifying
25 additive is a surface active substance or a surfactant.
8. The interchangeable electrolyte of claim 1 wherein the deposition modifying
30 additive is an organic compound having from 8 to 28 carbon atoms.

9. The interchangeable electrolyte of claim 1 wherein the deposition modifying additive is an organic compound having from 16 to 28 carbon atoms.

10. The interchangeable electrolyte of claim 1 wherein the deposition modifying
5 additive is an organic compound having a molecular weight of from 250 to 550.

11. An electrochemical cell comprising a positive electrode, an opposed negative electrode, an aqueous interchangeable electrolyte suitable for use in a battery cell and an electroplating cell, the aqueous interchangeable electrolyte in ionic contact with the negative
10 electrode, the interchangeable electrolyte engendered with a deposition modifying agent for inhibiting dendritic electrodeposition on the negative electrode of metal ions emanating from the positive electrode to reduce or inhibit mass gain of the negative electrode when in a battery cell and to promote a smooth surface finish when in an electroplating cell.

12. An electrochemical cell according to claim 11, wherein the deposition inhibiting agent is ionic in nature and attracted to the negative electrode or to an ionic species in the electrolyte, which together are attracted to the negative electrode.

13. An electrochemical cell according to claim 11, wherein the deposition modifying agent includes an alkyl substituent that is non-polar in nature and provides a barrier to metal
15 ions originating from the positive electrode.

14. An electrochemical cell according to claim 11, wherein the electrochemical cell is a secondary cell or an electroplating cell and wherein the deposition modifying agent and
25 electrolyte are interchangeable between the secondary cell and the electroplating cell on an equivalent volume basis or by concentration or dilution thereof to the appropriate specific gravity of each cell.

15. An electrochemical cell according to claim 14, wherein the secondary cell is a
30 lead acid battery cell and the electroplating cell is a tin electroplating cell.

16. An electrochemical cell according to claim 15, wherein the electrolyte is dilute sulfuric acid dosed with n-alkyl dimethyl benzyl ammonium chloride or sodium dioctyl sulphosuccinate as the deposition modifying agent.

5 17. A method of providing an interchangeable electrolyte for use in electroplating and battery electrochemical cells comprising providing an electrolyte, adding to the electrolyte a deposition modifying agent to form an interchangeable electrolyte which is compatible with the components of the electroplating and battery electrochemical cells, being non-reactive or slowly reactive with the electrolyte and capable of being attracted to the
10 negative electrode, providing at least one effect selected from the group consisting of inhibiting or preventing dendritic deposition of metal ions emanating from the positive electrode on the negative electrode in a battery electrochemical cell and promoting smooth electroplating of an electroplating surface in an electroplating electrochemical cell.

15 18. The method of claim 17 further comprising transferring the interchangeable electrolyte from the battery electrochemical cell to the electroplating electrochemical cell.

20 19. The method for claim 17 further comprising removing the interchangeable electrolyte from the battery electrochemical cell, adjusting the specific gravity of the interchangeable electrolyte by dilution or concentration, and adding the interchangeable electrolyte to an electroplating electrochemical cell.

25 20. The method of claim 17 further comprising removing the interchangeable electrolyte from the battery electrochemical cell, and blending the interchangeable electrolyte with a fresh electrolyte to form a recycled interchangeable electrolyte.